ABSTRACT OF THE DISCLOSURE

The present invention relates to an oral drug delivery system which delivers pharmaceutical active ingredients into the cell and/or its nucleus for the effective administration of nucleic acids including gene therapy, vaccination, administration of gene based drugs or administration of gene based treatment modalities, including the use of sense, antisense nucleotide sequences, antigens, antibodies, ribozymes, as well as oligonucleotides and polynucleotide constructs for gene correction. These actives may also include viruses, vectors, proteins, peptides, and nucleic acids, DNA or RNA fragments, which code functionally active or inactive or conditionally inactivatable proteins. The controlled delivery system of the present invention is substantially a free-flowing powder consisting of solid hydrophobic nanospheres encapsulated in pH sensitive microspheres. The controlled release system can be used to target and control the release of pharmaceutical active ingredients onto certain regions of the gastrointestinal tract, specially the small intestine. The invention further pertains to pharmaceutical products comprising the controlled release system of the present invention.